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FURTHER EXPERIMENTS ON TARAXACUM ROOT, WITH A VIEW OF ASCERTAINING ITS VARIED CHEMICAL COMPOSITION AT DIFFERENT SEASONS.

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It will be remembered that at the last meeting of the Academy of Science a paper was read on the above subject which endeavored to show that taraxacum root varied at different seasons of the year, not only in the amount of moisture it contained but also in the amount of other important constituents. In the last report special attention was given to the percentage of solids and reducible sugars. During the past year I have given the subject further attention, and have been able to extract other principles from the root. While I have advanced the investigation to a slight extent, I do not as yet consider the work completed by any means, and have not to my entire satisfaction been able to devise a process of analysis which shall fully and satisfactorily answer the questions which arise in connection with the subject. The method of examination has been as follows:

1. Treatment of the Fresh Root for Moisture and Extractive.—(a) Moisture: A known weight of the fresh root, chopped fine and spread in thin layer, was heated in a hot-air oven until it ceased to lose weight. The loss in weight was then computed. (b) Extractive: Another weighed portion was extracted with water 9 and alcohol 1 part. The dregs were then washed with warm water. The resulting mixed solutions were evaporated, and finally heated in a hot-air oven until the extract ceased to lose weight.

2. Treatment of Air-Dry Root for Taraxacin, Inulin, Reducing Sugars, and Levulin.—(a) Taraxacin: Ten grammes of the very finely powdered air-dry root was introduced into an extraction apparatus and percolated by continuous displacement with chloroform for eight hours. This chloroformic extractive, after the evaporation of the chloroform, was treated with distilled water and filtered. The precipitated resin was well washed upon the filter; the aqueous solution evaporated to dryness and the residue weighed and estimated as taraxacin. (b) Reducing sugars: The residue (dregs) from (a) were treated with alcohol in a continuous extraction apparatus for eight hours; the alcoholic extractive treated with water and the solution quantitatively estimated for sugar by Fehling's solution. (c) Inulin: The residue from (b) was treated with warm water until exhausted; the aqueous solution was concentrated and to the resulting evaporate was added three volumes of alcohol. The crude inulin was collected on a filter, dried at 100 degrees C., and weighed. (d) Levulin: The alcoholic filtrate from the inulin was evaporated to drive off the alcohol, and the dense residue dissolved in water. The solution, acidulated with HCl , was boiled for six hours, thus converting the levulin into reducing sugar. The sugar was estimated by Fehling's solution, and calculated into levulin.

The result of this examination of dandelion root collected at different seasons may be tabulated as follows:

With the exception of the month of January, the root was collected in each month from March to February inclusive, and analyses of each sample were

made. I shall not give the result of each analysis here, as it would be going beyond the limits of this paper, but I wish to call attention to a peculiar fact which was observed during this investigation; I have found, to my surprise, that different roots collected in the same month may vary immensely in composition. My attention was called to this fact in this way: In the course of this work it became necessary for me to use a root collected in June of the two years 1892 and 1893. The quantity collected of the former having been insufficient for the analysis, the root of 1893 was necessary for the completion of the work. The root of the first year had been collected and dried for me in the sun, and the root of this year was collected, washed, chopped fine and dried in thin layers in a hot-air oven at a temperature of 60 degrees C. The former had been collected from low, and the latter from very high ground. The following table shows the difference in the composition of the two specimens:

	Roots collected in	1892	1893
Moisture (in the dry root).....		9.79	9.48
Taraxacin (in the dry root).....		.612	.720
Inulin (in the dry root).....		9.34	4.83
Reducing sugars (in the dry root).....		12.50	2.60
Levulin (in the dry root).....		1.728	16.00